

Patent Claims:

1. A method for synchronization in a full-duplex-capable radio transmission system with CDMA access with
5 TDD mode, having a central radio base station and a plurality of subscriber stations which are independent of one another, in each case a matched filter with a downstream amplitude threshold value switch being assigned in each case to the individual subscriber
10 stations at the receiver end, comprising the following method steps:
- a) a preamble (1) is generated by the radio base station by spreading with a specific maximum sequence or gold sequence which is uniform for the
15 radio transmission system,
 - b) the preamble is transmitted synchronously in all telecommunications channels to all subscriber stations before the actual user data transmission (2),
 - 20 c) the preamble (1) is received by the subscriber stations,
 - d) the received preamble (1) is fed to the input of the respective matched filter of a subscriber station,
 - 25 e) the output signal of the matched filter is forwarded to the amplitude threshold value switch, and
 - f) a trigger signal is generated by the amplitude threshold value switch when a predefinable threshold Tr_1 is exceeded.
- 30 2. The method as claimed in claim 1, characterized in that the subscriber stations carry out averaging over time of the synchronization information which is determined, by means of a priori knowledge of the burst structure and duration.
- 35 3. The method as claimed in claim 1 or 2, characterized in that the radio base station is designed

with a matched filter with a downstream amplitude threshold value switch, and in each case a subscriber station transmits a specific synchronization sequence (3) to the radio base station within the delay time of the actual user data transmission (4), the radio base station receives the synchronization sequence (3) and determines the concrete signal transit time between the radio base station and the corresponding subscriber station by matched filtering with the upper transgression of an amplitude threshold value being evaluated as a trigger criterion at the filter output.

4. The method as claimed in claim 3, characterized in that the synchronization sequence (3) comprises a preamble and a plurality of identical symbols (5) which are spread with subscriber-specific or radio-system-specific maximum sequences or gold sequences, the individual symbols (5) being transmitted shifted successively by one system clock t_{sample} with respect to one another in each case, and the radio base station uses all the amplitude values at the output of the matched filter at the precise times of the symbol change for evaluation purposes, the time when an amplitude threshold value is exceeded when a preamble is received being used as a reference time value.

5. The method as claimed in claim 3 or 4, characterized in that the radio base station transmits to the subscriber station via the central service channel a status signal specifying which subscriber station is to transmit its synchronization sequence (3), and after the evaluation of the signal transit time determined in the radio base station an item of information is transmitted to the respective subscriber station via the service channel, said item of information specifying at which subscriber-specific starting times the transmission of user data or control information in the uplink should start so that the parallel transmissions of all the subscriber stations

are received in synchronism with the chip in the receiver of the radio base station.

6. The method as claimed in one of the preceding claims, characterized in that orthogonal gold sequences of the length of one symbol in each case are used for the code spreading of the data both in the uplink and in the downlink.

7. The method as claimed in one of the preceding claims, characterized in that adjacent radio transmission systems operate in different frequency positions and/or use different spread sequences in each case and/or use spread sequences from different code families.

8. The method as claimed in claim 7, characterized in that the respective radio base stations of the adjacent radio transmission systems operate synchronously with one another in the uplink cycle and in the downlink cycle.

9. A device for synchronization within a full-duplex-capable radio transmission system with CDMA access with TDD mode, comprising a central radio base station and a plurality of subscriber stations which are independent of one another, a matched filter with amplitude threshold value switch being assigned to each subscriber station at the reception end and at least one matched filter with amplitude threshold value switch being assigned to the radio base station at the reception end, characterized in that a preamble can be generated in the radio base station by spreading with a specific maximum sequence or gold sequence which is uniform for the radio transmission system and said preamble can be transmitted synchronously in all telecommunications channels from [sic] the actual user data transmission to the subscriber station.

10. The device as claimed in claim 9, characterized in that the radio transmission system is designed as a wireless local loop system.

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